

**IN THE APPLICATION**

**OF**

**JOSEPH PAWLUSH**

**FOR**

**FASTENING SYSTEM FOR CHAIR**

**CROSS-REFERENCE TO RELATED APPLICATION**

**[0001]** The present application claims the benefit of previously filed co-pending Provisional Patent Application, Serial No. 60/409,252, filed September 9, 2002.

**FIELD OF THE INVENTION**

**[0002]** The present invention relates to a new medium used for casual seating. More specifically, the present invention relates to a chair or other furnishing which has a seat and backrest comprised of slats which run between frames, where the slats are connected to the frames using a novel fastening method.

**BACKGROUND OF THE INVENTION**

**[0003]** Some examples of fasteners are disclosed in U.S. Pat. No. 6,612,796 entitled "Push-In Fastener Assembly With Interfering Element" issued on Sep. 2, 2003 to Gattone; U.S. Pat. No. 6,379,093 entitled "Captive Fastener Member and System for Joining Two Work Pieces" issued on Apr. 30, 2002 to Bondarowicz et al.; U.S. Pat. No. 6,361,261 entitled "Fastener Assembly with Interference Element" issued on Mar. 26, 2002 to Gattone et al; U.S. Pat. No. 6,231,223 entitled "Intermediate Fastening Element for Fitting a Reflector on a Support Element of a Headlamp" issued

on May 15, 2001 to Zucar et al.; U.S. Pat. No. 6,152,667 entitled "Blind Aperture Fastener" issued on Jul. 18, 2000 to LeVey; U.S. Pat. No. 5,522,635 entitled "Tonneau Cover and Frame for Pick-Up Trucks" issued on Jun. 4, 1996 to Downey; U.S. Pat. No. 5,469,606 entitled "Clamp Means for Joining Objects Together" issued on Nov. 28, 1995 to Hansen; U.S. Pat. No. 5,098,242 entitled "Plastic Fastener for Threaded Stud" issued on Mar. 24, 1992 to Schaty; U.S. Pat. Nos. 4,750,878 and 4,624,585, both entitled "Retainer Bushing" issued on Jun. 14, 1988 and Nov. 25, 1986, respectively, to Nix et al.; U.S. Pat. No. 3,551,963 entitled "Self-Locking Snap Fastener" and issued on Aug. 16, 1968 to Mosher, Jr. et al.; U.S. Pat. No. 3,226,145 entitled "Resilient Covered Bumper Guard" issued on May 28, 1964 to Goldberg; U.S. Pat. No. 2,156,003 entitled "Fastening Device" issued on Jun 11, 1938 to G.A. Tinnerman; U.S. Pat. No. 1,849,604 entitled "Fastening and Connecting Device" issued on Aug. 1, 1929 to Weatherhead, Jr.; and U.S. Pat. No. 207,871 entitled "Elastic Packing for Pistons" issued on Sep. 10, 1878 to Horton et al.

[0004] Examples of slat back chairs are disclosed in U.S. Pat. No. 6,036,273 entitled "Chair Structure" issued on Mar. 14, 2000 to Lin; U.S. Pat. No. D467,444 entitled "Slat Back Chair" issued on Dec. 24, 2002 to Hess et al.; and U.S. Pat. No. D465,939 entitled "Chair" issued on Nov. 26, 2002 to Kolberg.

## **SUMMARY OF THE INVENTION**

[0005] The present invention relates to a chair or other furnishing which has a seat and backrest comprised of slats which run between frames, where the slats are connected to the frames using a novel fastening method. The slat is first created which contains a support member. To do this two attachment pins are inserted through holes in the slat support member. This assembly is then placed into a textured aluminum mold and located within the mold by the two attachment pins. The mold is sealed and injected with the self-skinning urethane formulation, well known in the art, thus totally encapsulating the support member. After initial curing, the slat is removed from the mold and allowed to final cure for 24 hours. Seating frame thru-holes are bored in the seating frame on

appropriate spacing. Receivers are inserted into each of seating frame thru-holes. The finished slat is attached to seating frame by pushing both attachment pins through receivers until attachment pins latch within the receivers, which in turn latch within the seating frames.

[0006] It is therefore an object of the present invention to provide a fastener assembly which can be used with seating assemblies.

[0007] It is therefore a further object of the present invention to provide a fastener assembly which can be installed with a simple motion thereby resulting in reduced installation costs.

[0008] It is therefore a still further object of the present invention to provide a fastener assembly which fastens securely.

[0009] It is therefore a still further object of the present invention to provide a fastener assembly which can be manufactured economically.

[0010] It is therefore a still further object of the present invention to provide a fastener assembly with increased strength

### **BRIEF DESCRIPTION OF THE DRAWINGS**

[0011] The following figures set forth the preferred embodiment of the present invention:

[0012] FIG. 1 depicts a slat back chair comprising the present invention.

[0013] FIG.2 depicts a partial cross-section of a side view of typical slat of the present invention, including the novel method for fastening a slat to the chair frame.

### **DESCRIPTION OF THE PREFERRED EMBODIMENT**

[0014] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. It will be understood that the components of the presently preferred embodiments of the present invention, as generally described and illustrated in the figures herein, could be arranged and designed in a wide variety of different configurations. Thus, this invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art, and will be merely representative of the presently preferred embodiments of the invention.

[0015] The present invention comprises a chair or other piece of furniture which includes elements that make up the seating and backrest portions and which are made of self-skinned urethane. In the preferred embodiment, there is included a series of horizontal slats running between two frames of a chair. The slats have a structural insert which is blind fastened to a supporting aluminum frame, where self-skinned urethane is cast around the insert as a cushioning material.

[0016] Although the preferred embodiment of the present invention includes a chair comprised of a series of slats, it is to be understood that the present invention is not limited to chairs, but includes all types of furnishings, nor is it limited to furnishings which include a series of slats, but is also meant to encompass any device in which the seat or backrest are made of a single, unitary element. The fastening method of the present invention may be applied to a multitude of devices.

[0017] The various components of the preferred embodiment of the present invention will now be described in more detail. With reference to Figure 1, it can be seen that a chair including the present invention has a series of slats (1) connected to two seating frames (2). In the preferred embodiment, the frames (2) are manufactured of aluminum or other materials appropriate for the application, such materials being well-known to those in the art. The chair of the present invention may also have any number of additional frame elements (3) as may be structurally or aesthetically appropriate.

**[0018]** Referring now to Figure 2, there is seen a partial cross-section of a typical slat (1). More specifically, Figure 2 depicts one end of a typical slat, the other end being designed to be the converse of the first end. Within each slat is a structural support member (10) as described in more detail below. Figure 2 also depicts the various components of a novel fastening system, also described below, attached to seating frame (2).

#### Support Member

**[0019]** As seen in Figure 2, located within each slat (1) is support member (10) which may be made of any suitable material. In the preferred embodiment, support member (10) is made of injection molded structural nylon. There is included longitudinal ribbing (not shown) to provide lengthwise support, but which also gives slightly in use to provide additional cushioning effect to the urethane covering. In the preferred embodiment, there are five longitudinal ribs on both sides of the width dimension of support member (10), i.e., that dimension which would be oriented facing a user sitting in a chair of the present invention. The longitudinal ribs extend approximately the entire length of the support member (10) in the preferred embodiment.

#### Attachment Pin

**[0020]** Support member (10) is secured to the seating frame (2) by a structural nylon attachment pin (21). Attachment pin (21) includes a head component (21A) and a shaft component (21B). Near the end of shaft component (21B) is a step (21C) which is created by a narrowing of the diameter of shaft component (21B) for a certain distance. In other words, shaft component (21B) has a certain diameter throughout most of its length, but tapers inward slightly near the end, then juts out again to create step (21C). The function of step (21C) will be described in more detail below.

**[0021]** Attachment pin (21) passes through thru-hole (11) in the support member (10) and into seating frame (2) by way of seating frame thru-hole (2A). During construction of support member (10), attachment pin (21) is inserted through thru-hole (11) prior to application of the self-skinning

urethane. Specifically, support member (10) and pins (21) are inserted into a mold and the urethane encapsulates the assembly, leaving only the shaft end of attachment pin (21) exposed.

#### Receiver

**[0022]** Attachment pin (21) is fastened to seating frame (2) by receiver (31). Receiver (31) includes receiver head component (31A) and receiver barrel component (31B). Receiver head (31A) has a greater diameter than receiver barrel (31B). Receiver barrel (31B) may include one or more segments (31C), where such segments connect on one end to receiver head component (31A) and on the other end to retaining ring (31D). Receiver barrel segments (31C) are separated from each other by gaps (31F) between such segments. Receiver barrel (31B) has an internal cavity running along its longitudinal axis. The internal bore within receiver barrel component (31B) is tapered inwardly slightly in the direction running from receiver head component (31A) toward retaining ring (31D). For better understanding, receiver (31) is depicted in bold in Figure 2.

**[0023]** Seating frame (2) includes seating frame thru-hole (2A) for accepting receiver (31). During assembly of slat (1) to seating frame (2), receiver (31) is first inserted into seating frame thru-hole (2A). Attachment pin (21) is then pushed through receiver (31), thus causing receiver barrel segments (31C) to be forced outwardly by the tapered internal bore of receiver barrel (31B). As receiver barrel segments (31C) are forced outward by attachment pin (21), receiver (31) creates a tight fit within seating frame (2). Also, as the end of attachment pin (21) passes retaining ring (31D), the ring pulls back under step (21C) on attachment pin (21) and thereby latches the pin to prevent pullout. In this configuration, receiver (31) also serves to insulate attachment pin (21) from seating frame (2), allowing for reduced wear and tear on attachment pin (21) which may otherwise result from direct contact with seating frame through continued repetitive use of the chair of the present invention.

**[0024]** There is also included on support member (10) a circular locating boss (12). An internal boss receiver cavity (31E) within receiver head (31A) accepts locating boss (12), thus further increasing resistance to shear on attachment pin (21).

#### Manufacture and Assembly

**[0025]** Slat (1) is first created. First, two attachment pins (21) are inserted through supporting member thru-holes (11) in supporting member (10). This assembly is then placed into a textured aluminum mold and located within the mold by the two attachment pins. The mold is sealed and injected with the self-skinning urethane formulation, well-known in the art, thus totally encapsulating the nylon support member (10). After initial curing, slat (1) is removed from the mold and allowed to final cure for 24 hours.

**[0026]** Seating frame thru-holes (2A) are bored in seating frame (2) on appropriate spacing. The entire chair frame assembly is welded, cleaned, and painted its final color. Receivers (31) are inserted into each of seating frame thru-holes (2A). The finished slat (1) is attached to seating frame (2) by pushing both attachment pins (21) through receivers (31) until attachment pins (21) latch within receivers (31), which in turn latch within seating frames (2).

**[0027]** Many modifications and other embodiments of the invention will come to the mind of one skilled in the art having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the scope. It should be noted that the various elements of the present invention may be used to achieve the purposes described herein alone or in combination. For example, the fastening system of the present invention would have application in a variety of situations, where it is desired to include a fastening device which is not readily seen from the exterior. Lastly, the materials used for the various components of the present invention may vary widely, and such acceptable materials would be well-known to those skilled in the art and within the scope of the present invention.